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05 2003608

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CALIFORNIA
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LEAD SHEET

FEE

FEE $28.- M
DAF $ 2.-
C-20

94

D.T.T.

CODE
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CODE
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Assessor's Identification Number (AIN)
To be completed by Examiner OR Title Company in black ink.

Number of AIN's Shown

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COMMONWEALTH LAND TITLE CO.

05 2003608

Recording Requested By:

Honeywell International Inc.
101 Columbia Turnpike
Morristown, NJ 07962

When Recorded, Mail To:
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013
6151747-27

COVENANT AND ENVIRONMENTAL RESTRICTION ON PROPERTY

THIS COVENANT AND ENVIRONMENTAL RESTRICTION ON PROPERTY ("Covenant") is made as of the 18th day of August 2005 by **HONEYWELL INTERNATIONAL INC.**, a Delaware corporation ("**Covenantor**") which is the Owner of record of that certain property situated at 850 South Sepulveda Boulevard in the City of El Segundo, County of Los Angeles, State of California, which property is more particularly described in Exhibit A attached hereto and incorporated herein by this reference (hereinafter referred to as the "**Burdened Property**"), for the benefit of the **CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD** ("**Board**," as further defined in Section 2.01 below), Los Angeles Region, with reference to the following facts:

A. The Burdened Property and groundwater underlying it contain hazardous materials.

B. Historical operations at the Burdened Property include sulfuric acid production, solvents recycling and distribution, and wastewater treatment.

1. These operations resulted in the contamination of soil and groundwater with organic chemicals including trichloroethene, cis-1,2-dichloroethene and xylene, and the contamination of shallow soil with organic and inorganic chemicals including dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethylene (DDE), dichlorodiphenyldichloroethane (DDD), benzo[a]pyrene, benzo[a]anthracene, benzo[b,k]fluoranthene, chrysene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene, heptachlor epoxide, Aroclor 1248, Aroclor 1260, chromium, antimony, lead, and arsenic. The foregoing contaminants are hazardous materials as that term is defined in California Health & Safety Code § 25260.

2. The contaminants at the Burdened Property have been addressed in the shallow soils by removing the soils that exceeded risk-based criteria approved by the

4138-15-04

Board to a depth of approximately ten feet below ground surface. The contaminants in the groundwater shall be addressed during the Groundwater Remediation Work (as defined in Section 2.06 below), and by the placement of vapor barriers under buildings to be constructed at the Burdened Property, as may be appropriate.

C. The contaminants addressed in this Covenant are present in soil and groundwater on or under the Burdened Property. The Board has issued a no further action letter with respect to the top 10 feet of the soil, a copy of which is attached hereto as **Exhibit B**. Without the mitigation measures which have been and will be performed on the Burdened Property, exposure to these contaminants could take place through contact with subsurface soils during the course of subsurface excavation activities and work; through contact with groundwater or surface water accumulating in excavated areas; and through inhalation of contaminants volatizing from groundwater or subsurface soils. The risk of public exposure to the contaminants has been and will be substantially lessened by the remediation and controls described herein.

D. The Burdened Property is currently vacant, but it is intended for commercial, retail, office and/or industrial use and it is adjacent to commercial and industrial uses.

E. Full and voluntary disclosure to the Board of the presence of hazardous materials on the Burdened Property has been made and extensive sampling of the Burdened Property has been conducted.

F. Covenantor desires and intends that in order to benefit the Board and to protect the present and future public health and safety, the Burdened Property shall be used in such a manner as to avoid potential harm to persons or property that may result from hazardous materials that may have been deposited on portions of the Burdened Property.

ARTICLE I. GENERAL PROVISIONS

Section 1.01 **Provisions to Run with the Land.** This Covenant sets forth protective provisions, covenants, conditions and restrictions (collectively referred to as "**Restrictions**") upon and subject to which the Burdened Property and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. The restrictions set forth in Article III are reasonably necessary to protect present and future human health and safety or the environment as a result of the presence of hazardous materials in the land and groundwater. Each and all of the Restrictions are for the benefit of all portions of the Burdened Property, shall run with the land, shall pass with each and every portion of the Burdened Property, and shall apply to, inure to the benefit of, and bind the respective successors in interest thereof, for the benefit of the Board, the Covenantor and all Owners (as defined in Section 2.08 below) and Occupants (as defined in Section 2.09 below). Each and all of the Restrictions are imposed upon the entire Burdened Property. Each and all of the Restrictions run with the land pursuant to section 1471 of the Civil Code. Each and all of the Restrictions shall be enforceable by the Board and by the Covenantor.

Section 1.02 **Concurrence of Owners and Lessees Presumed.** All purchasers, lessees, or possessors of any portion of the Burdened Property shall be deemed by their purchase,

leasing, or possession of such Burdened Property to be in accord with the foregoing and to agree for and among themselves, their heirs, successors, and assignees, and the agents, employees, and lessees of such owners, heirs, successors, and assignees, that the Restrictions as herein established must be adhered to for the benefit of the Board, the Covenantor and the Owners and Occupants of the Burdened Property and that the interest of the Owners and Occupants of the Burdened Property shall be subject to the Restrictions contained herein.

Section 1.03 **Incorporation into Deeds and Leases.** Covenantor desires and covenants that the Restrictions set out herein shall be incorporated by it in and attached to each and all deeds and leases of any portion of the Burdened Property and Covenantor requests that all future Owners of the Burdened Property, or any portion thereof, similarly cause that the Restrictions set out herein shall be incorporated by them in and attached to each and all deeds and leases of any portion of the Burdened Property executed by them. Nevertheless, recordation of this Covenant shall be deemed binding on all successors, assigns, subsequent Owners and lessees, regardless of whether a copy of this Covenant and Agreement has been attached to or incorporated into any given deed or lease.

Section 1.04 **Purpose.** It is the purpose of this instrument to convey to the Board real property rights and to retain certain such rights for Covenantor, which rights will run with the land, to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual hazardous materials.

ARTICLE II. DEFINITIONS

Section 2.01 **Board.** "Board" shall mean the California Regional Water Quality Control Board, Los Angeles Region and shall include its successor agencies, if any.

Section 2.02 **Board-Approved Work.** "Board-Approved Work" shall mean current and future remedial and investigation work performed pursuant to plans, procedures and requirements approved by the Board.

Section 2.03 **Burdened Property.** "Burdened Property" shall have the meaning given in the first paragraph appearing above.

Section 2.04 **Covenant.** "Covenant" shall have the meaning given in the first paragraph appearing above.

Section 2.05 **Covenantor.** "Covenantor" shall have the meaning given in the first paragraph appearing above, and also shall include the successors and assigns of Honeywell International Inc.; provided, the foregoing notwithstanding, Covenantor shall not include any Owner other than Honeywell International Inc.

Section 2.06 **Groundwater Remediation Work.** "Groundwater Remediation Work" shall mean Board-Approved Work for remediating contamination in the groundwater at the Burdened Property.

Section 2.07 **Improvements.** "Improvements" shall mean all buildings, roads, driveways, regradings, and paved parking areas, constructed or placed upon any portion of the Burdened Property.

Section 2.08 **Occupants.** "Occupants" shall mean any persons entitled by ownership, leasehold, or other legal relationship to use and/or occupy all or any portion of the Burdened Property.

Section 2.09 **Owner or Owners.** "Owner" or "Owners" shall mean the Covenantor and/or its successors in interest during the period that Covenantor and/or its successors in interest hold title to all or any portion of the Burdened Property. Upon conveyance of the Burdened Property, "Owner" or "Owners" shall also mean the person or entity that holds title to all or any portion of the Burdened Property.

Section 2.10 **Restrictions.** "Restrictions" shall have the meaning given in Section 1.01 above.

ARTICLE III. DEVELOPMENT, USE AND CONVEYANCE OF THE BURDENED PROPERTY

Section 3.01 **Restrictions on Development and Use.** Owners shall restrict the use of the Burdened Property as follows:

(a) Development of the Burdened Property shall be restricted to industrial, commercial, retail or office space uses.

(b) No residence for human habitation shall be permitted on the Burdened Property; provided, the foregoing notwithstanding, the Burdened Property may be used for purposes of a hotel on condition that all hotel rooms for overnight accommodation shall be at least one (1) floor above the ground floor; there shall be no hotel basement space. In the event such hotel use contradicts or requires modification to the risk assessment(s) used to obtain regulatory approvals of remedial activities at the Burdened Property (including, without limitation, institutional and engineering controls), the Owner or Occupant shall, at the Owner or Occupant's expense and to the Covenantor's reasonable satisfaction, (i) prepare a revised risk assessment appropriate for such hotel use, (ii) obtain approval for such use from the City of El Segundo and from applicable state agencies including, without limitation, the Board, and (iii) perform any new and additional remedial activities and modifications to existing remedial activities that may be required by such revised risk assessment and approval;

(c) No hospitals shall be permitted on the Burdened Property;

(d) No schools for persons under twenty one (21) years of age shall be permitted on the Burdened Property;

(e) No day care centers for children or senior citizens shall be permitted on the Burdened Property;

(f) Owners or Occupants of the Burdened Property or any portion thereof may conduct excavation work on the Burdened Property without further notice to or approval by the Board to the extent that such excavation work is confined to the first four (4) feet below ground surface or is wholly within refilled soils in areas that previously have been excavated and refilled with clean fill. Owners or Occupants shall perform no other excavation work unless pursuant to a health and safety plan approved in writing by the Board. Any contaminated soils brought to the

surface by grading, excavation, trenching, or backfilling shall be managed by the Owner and/or Occupants in accordance with all applicable provisions of local, state and federal law;

(g) All uses and development of the Burdened Property shall be consistent with any applicable Board order or risk management plan, each of which is hereby incorporated herein by reference, and including future amendments thereto. All uses and development shall preserve the integrity of any existing or future remedial measures pursuant to the requirements of the Board including, without limitation, any cap, remedial equipment, groundwater monitoring system, or any other Board-Approved Work on the Burdened Property, unless otherwise expressly permitted in writing by the Board and Covenantor.

(h) No Owners or Occupants of the Burdened Property or any portion thereof shall drill, bore, otherwise construct, or use a well for the purpose of extracting water for any use, including but not limited to, domestic, potable, or industrial uses.

(i) In the event that the Covenantor, Owners or Occupants are responsible for or cause any of the following occurrences, the responsible entity shall notify the Board in writing of the occurrence, including: (i) the type, cause, location and date of any material disturbance (but not including routine maintenance) to any cap or remedial measures, any remedial equipment and the groundwater monitoring system on the Burdened Property installed currently or in the future pursuant to the requirements of the Board, which could affect the ability of such cap or remedial measures, remedial equipment, or monitoring system to perform their respective functions and (ii) the type and date of repair of such disturbance. Notification to the Board shall be made by registered mail within ten (10) working days of both the discovery of such disturbance and the completion of repairs.

(j) The Owner and Occupant shall provide to the Board and Covenantor, and to any other persons acting pursuant to Board orders or performing Board-Approved Work, reasonable access to the Burdened Property for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code, and for the performance of such Board-Approved Work.

(k) No Owner or Occupant of the Burdened Property shall act in any manner that will aggravate or contribute to the existing environmental conditions of the Burdened Property. All use and development of the Burdened Property shall be conducted in such manner so as to preserve the integrity of any capped areas and be consistent with the performance of Board-Approved Work.

(l) All Occupants shall execute a written instrument which shall accompany all purchase agreements or leases relating to the Burdened Property. Such instrument shall contain the following statement:

> All Occupants acknowledge that a vapor barrier has been installed underneath each building on the Burdened Property to protect indoor air quality, and that such barrier is specially sealed to avoid any vapor intrusions to the building. Each Occupant will take all appropriate steps to protect the integrity of the barrier at all times, including avoiding taking any action that may result in breach, cutting, holes, openings or any other penetration or intrusion of the barrier therein. Prior to conducting any activities that may pose a risk to the integrity of the barrier,

including without limitation penetration, drilling or cutting, each Occupant shall provide Owner with a 10-day notice of such proposed action, and shall: (i) designate a contractor qualified to work with such barrier; (ii) inform such contractor of the existence of the barrier and the need to maintain its integrity; (iii) obtain Owner's prior written approval of such contractor, in Owner's sole discretion; and (iv) obtain Owner's prior written approval to engage in any such activity.

Each Occupant shall ensure that the approved contractor: (v) understands the location of plumbing and utilities located below the barrier; (vi) reviews as-built construction drawings to determine location of the subslab vent system, monitoring probes and remediation equipment; (vii) take all appropriate steps to prevent disturbance, cutting or scratching of the barrier; (viii) replace sand layer as soon as practicable; (ix) test barrier seam/folds and visually inspect barrier for damage. Owner shall have the right, but not the obligation, to be present and/or monitor Occupant's proposed activities.

Section 3.02 **Enforcement.** Failure of an Owner or Occupant to comply with any of the restrictions, as set forth in Section 3.01 above, shall be grounds for the Board and/or Covenantor, by reason of this Covenant, to have the authority to require that the Owner modify or change the use of any Improvements constructed in violation of that paragraph so as to comply with such restrictions, unless such Improvements were constructed and used in accordance with entitlements approved by the City of El Segundo, or permitted by the Board pursuant to Section Section 3.01(a) or Section 3.01(b) above. The Board and covenantor shall provide the Owner or Occupant with written notice to cure, and the Owner or Occupant shall commence the cure within thirty (30) days thereafter.

(a) Violation of the Covenant shall be grounds for the Board and the Covenantor to file civil actions against the Owner as provided by law.

(b) There are no adequate remedies at law for violation of the Covenant, and the failure of any Owner or Occupant to comply with the Covenant may be enjoined (including both mandatory and prohibitory injunctions) by appropriate legal proceedings instituted by Covenantor and/or the Board.

Section 3.03 **Notice in Agreements.** After the date of recordation hereof, all Owners and Occupants shall execute a written instrument which shall accompany all purchase agreements or leases relating to the Burdened Property. Any such instrument shall contain the following statement:

The land described herein contains or has contained hazardous materials in soils and in the ground water under the property, and is subject to a Covenant and Environmental Restriction on Property dated as of August 18, 2005, and recorded on _____, 2005, in the Official Records of Los Angeles County, California, as Instrument No. _____, which Covenant and Environmental Restriction imposes certain covenants,

conditions, and restrictions on usage of the property described herein. This statement is not a declaration that a hazard exists.

ARTICLE IV. VARIANCE, TERMINATION, MODIFICATION AND TERM

Section 4.01 **Variance.** Subject to Section 4.03 below, any Owner or, with the Owner's consent, any Occupant of the Burdened Property or any portion thereof may apply to the Board for a written variance from the provisions of this Covenant.

Section 4.02 **Termination.** Subject to Section 4.03 below, any Owner or, with the Owner's consent, any Occupant of the Burdened Property or a portion thereof may apply to the Board for a termination of the Restrictions as they apply to all or any portion of the Burdened Property.

Section 4.03 **Modification.** This Covenant may not be modified in any way (including, without limitation, by variance pursuant to Section 4.01 above and termination pursuant to Section 4.02 above) without notice to and the prior written consent of Covenantor, which consent may be given or withheld in the sole and absolute discretion of Covenantor. Any purported modification in violation of this Section 4.03 shall be of no force and effect.

Section 4.04 **Term.** Unless terminated in accordance with Section 4.02 above, by law or otherwise, this Covenant shall continue in effect in perpetuity, except that any activities set forth in **Error! Reference source not found.** that are the subject of a no further action letter by the Board or other governmental authority shall terminate upon the issuance of such no further action letter.

ARTICLE V. MISCELLANEOUS

Section 5.01 **No Dedication Intended.** Nothing set forth herein shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Burdened Property or any portion thereof to the general public.

Section 5.02 **Notices.** Whenever any person gives or serves any notice, demand, or other communication with respect to this Covenant, each such notice, demand, or other communication shall be in writing and shall be deemed effective (a) when delivered, if personally delivered or sent by overnight courier, such as, without limitation, Fed Ex, to the person being served or official of a government agency being served, or (b) three (3) business days after deposit in the mail if mailed by United States mail, postage paid certified, return receipt requested:

If To: "Covenantor"
William J. Hague
Honeywell International Inc.
Specialty Materials-Engineering Department
101 Columbia Road
Mail Stop NIC-3
Morristown, N.J. 07962

with a copy to:
Chief Environmental Counsel
Honeywell International Inc.
101 Columbia Road
Morristown, NJ 07962

With a copy to
Mr. Allan Mackenzie
Mar Ventures, Inc.
2050 West 19th Street, Suite 201
Torrance, California 90504

With a copy to:
Mr. Daniel Crosser
Comstock, Crosser and Associates Development Company, Inc.
321 12th Street, Suite 200
Manhattan Beach, CA 90266

If To: "Board"
Regional Water Quality Control Board
Los Angeles Region
Attention: Mr. Jonathan S. Bishop, Executive Officer
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Section 5.03 **Partial Invalidity.** If any portion of the Restrictions or terms set forth herein is determined to be invalid for any reason, the remaining portion shall remain in full force and effect as if such portion had not been included herein.

Section 5.04 **Article Headings.** Headings at the beginning of each numbered article of this Covenant are solely for the convenience of the parties and are not a part of the Covenant.

Section 5.05 **Recordation.** This instrument shall be executed by the Covenantor and by the Executive Officer of the Board. This instrument shall be recorded by the Covenantor in the County of Los Angeles within ten (10) days of the date of execution.

Section 5.06 **References.** All references to Code sections include successor provisions.

Section 5.07 **Construction.** Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the Covenant to affect the purpose of this instrument and the policy and purpose of the Water Code. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

10

IN WITNESS WHEREOF, the parties execute this Covenant as of the date set forth above.Covenantor: **HONEYWELL INTERNATIONAL INC.**

By: _____
Philip E. Hammel
Title: Director, Real Estate Development
Date: August 18, 2005

11

STATE OF CALIFORNIA)
)
COUNTY OF LOS ANGELES)

Acknowledgment as to Covenantor

On August 18, 2005, before me, Debbie A. Dalton, the undersigned personally appeared Philip E. Hamnel,
[insert Covenantor's or Covenantor's agent's name]
____ personally known to me or ✓ proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Debbie A. Dalton
Notary Public in and for said
County and State

DEBBIE A. DALTON
Commission # 1454049
Notary Public - California
Santa Clara County
My Comm. Expires Dec 2, 2007

12

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

ALL THAT CERTAIN REAL PROPERTY SITUATED IN THE COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

PARCEL 1 IN THE CITY OF EL SEGUNDO, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA, OF PARCEL MAP NO. 17911, AS PER MAP FILED IN BOOK 269 PAGES 82 THROUGH 84, INCLUSIVE OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

EXHIBIT B

NO FURTHER ACTION LETTER

13

14

REMEDIAL ACTION PLAN
FOR SOIL

HONEYWELL EL SEGUNDO SITE

850 South Sepulveda Boulevard
El Segundo, California

Prepared for

Honeywell

HONEYWELL INTERNATIONAL INC.
2525 West 190th Street
Torrance, California 90504

Prepared by

PARSONS

2121 N. California Blvd., Suite 500
Walnut Creek, CA 94596
(925) 941-3700 Fax (925) 979-9781

OCTOBER 5, 2004

15

REMEDIAL ACTION PLAN
FOR SOIL

HONEYWELL EL SEGUNDO SITE

850 South Sepulveda Boulevard
El Segundo, California

Prepared for

HONEYWELL INTERNATIONAL INC.
2525 West 190th Street
Torrance, California 90504

REGISTERED PROFESSIONAL ENGINEER
HUSHENG FENG
Exp. 9/30/05
C 50850
CIVIL
STATE OF CALIFORNIA

OCTOBER 5, 2004

Approved by

Marcus Long, PE/ Project Engineer — Date 10/6/04

Robert Briggs, PE/ Technical Director — Date 10/6/04

Terry H. Feng, PhD, PE, CHG/ Sr. Project Manager — Date 10/6/04

PARSONS

16

TABLE OF CONTENTS

Section Page

LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS VIII
EXECUTIVE SUMMARY ES-1
1 INTRODUCTION 1-1
1.1 PURPOSE 1-1
1.2 SITE DESCRIPTION AND HISTORY 1-2
1.2.1 Refrigerant Plant Parcel 1-2
1.2.2 UND-4 and -5 Parcel 1-3
1.2.3 SW Corner Lot Parcel 1-3
1.3 GEOLOGY AND HYDROGEOLOGY 1-3
1.4 SITE INVESTIGATIONS 1-4
1.5 HISTORIC SITE REMEDIATION 1-4
1.5.1 Remediation of Chloroform Spill 1-5
1.5.2 Soil Cover in UND-5 1-5
1.5.3 Soil Vapor Extraction 1-5
1.6 SITE DEMOLITION ACTIVITIES AND INTERIM SOIL REMOVAL ACTION 1-5
2 REMEDIAL INVESTIGATION FINDINGS 2-1
2.1 IDENTIFICATION OF SITE-RELATED CHEMICALS AND CHEMICALS OF POTENTIAL CONCERN 2-1
2.2 COPC DISTRIBUTION IN SOIL 2-1
2.2.1 Summary of Shallow Soil Matrix Investigation Findings 2-1
2.2.2 Summary of Deep Soil Investigation Findings 2-12
2.3 COPC DISTRIBUTION IN SOIL VAPOR 2-14
2.3.1 Shallow Soil Vapor Findings 2-14
2.3.2 Deep Soil Vapor Findings 2-15
2.3.3 Lateral Distribution of VOCs in Soil Vapor 2-16
2.3.4 Vertical Distribution of VOCs in Soil Vapor 2-17
2.3.5 Comparison of Current and Historic Soil Vapor Data 2-17
2.4 COPC DISTRIBUTION IN GROUNDWATER 2-17
2.5 CONCEPTUAL SITE MODEL 2-19

05 2003608

3 PROPOSED SITE DEVELOPMENT 3-1

4 FATE AND TRANSPORT OF COPCS 4-1

4.1 NATURAL ATTENUATION 4-1

4.2 SCEENING USING DESIGNATED LEVEL METHODOLOGY 4-2

4.3 VLEACH MODELING 4-2

4.3.1 VLEACH Modeling Scenarios 4-3

4.3.2 VLEACH Modeling Results 4-3

4.4 ACTION LEVELS FOR GROUNDWATER PROTECTION 4-4

5 HUMAN HEALTH RISK ASSESSMENT 5-1

5.1 DATA COLLECTION/EVALUATION AND IDENTIFICATION OF CHEMICALS OF POTENTIAL CONCERN (COPCS) 5-1

5.2 EXPOSURE ASSESSMENT 5-1

5.2.1 Exposure Setting and Exposure Pathways 5-1

5.2.2 Quantifying Exposure 5-5

5.3 TOXICITY ASSESSMENT 5-6

5.4 RISK CHARACTERIZATION 5-7

5.4.1 Risk Estimation 5-7

5.4.2 Cumulative Effects 5-7

5.4.3 Uncertainties 5-8

5.4.4 Risk-Management Targets 5-8

5.5 RISK ASSESSMENT RESULTS 5-9

5.5.1 Shallow-Soil RI 5-9

5.5.2 Step 5 RI Data 5-9

5.5.3 Sitewide Soil-Vapor Data 5-11

6 REMEDIAL ACTION OBJECTIVES AND ACTION LEVELS 6-1

6.1 REMEDIAL ACTION OBJECTIVES 6-1

6.2 ACTION LEVELS FOR SOIL 6-1

6.3 ACTION LEVELS FOR SOIL VAPOR 6-3

7 TECHNOLOGY SCREENING 7-1

7.1 SHALLOW SOILS 7-1

7.2 SOIL VAPOR PLUME 7-2

8 REMEDIAL ACTION PLAN FOR IMPACTED SHALLOW SOIL 8-1

8.1 PHASE I PARCELS (REFRIGERANT PLANT AND SW CORNER LOT) 8-1
8.1.1 Interim Remedial Measure (IRM) for Shallow Soil 8-1
8.1.2 Confirmation Sampling 8-2
8.1.3 Final Risk Assessment 8-2
8.1.4 IRM Completion Report 8-2
8.1.5 Closure of Shallow Soil 8-3
8.1.6 Implementation Schedule 8-3
8.2 PHASE II REVELOPMENT PARCELS (UND-4 AND UND-5) 8-3
9 REMEDIAL ACTION PLAN FOR VOC VAPOR PLUME 9-1
9.1 SOIL VAPOR EXTRACTION – REFRIGERANT PLANT PLUME 9-1
9.1.1 Existing Pilot SVE System 9-1
9.1.2 Conceptual Full-scale SVE System Layout 9-1
9.1.3 Offgas Treatment System 9-2
9.1.4 Permits 9-3
9.1.5 System Design, Construction and Startup 9-3
9.1.6 System Operation and Maintenance 9-3
9.1.7 Performance Monitoring, Evaluation and Optimization 9-4
9.1.8 Re-bounding Test/ Confirmation Sampling 9-4
9.1.9 Termination 9-4
9.1.10 Implementation Schedule 9-5
9.2 SOIL VAPOR EXTRACTION – OLD SOLVENT WAREHOUSE PLUME 9-5
9.2.1 Conceptual SVE System Layout 9-5
9.2.2 Offgas Treatment System 9-5
9.2.3 Permit 9-6
9.2.4 System Design, Construction and Startup 9-6
9.2.5 System Operation and Maintenance 9-6
9.2.6 Performance Monitoring, Evaluation and Optimization 9-6
9.2.7 Re-bounding Test/ Confirmation Sampling 9-7
9.2.8 Termination 9-7
9.2.9 Implementation Schedule 9-7
9.3 CONTINGENCY PLAN 9-7
9.3.1 Vapor Barrier for Select Buildings 9-7

9.3.2 Air Quality Monitoring 9-7
10 REFERENCES 10-1

TABLES

2.1.1 Step 1 through Step 5 COPC Evaluation Matrix

2.1.2 Summary of Compounds Retained as COPCs

2.1.3 Summary of Preliminary Soil Screening Levels for Volatile Organic Compounds (VOCs)

2.1.4 Summary of Preliminary Soil Vapor Screening Levels for Volatile Organic Compounds (VOCs)

2.2.1 Summary of Potential Shallow Soil Hot-Spots

4.1 Summary of Soil Cleanup Goals for Groundwater Protection

5.1 Summary of Cumulative Risk and Cumulative Hazard Estimates from Exposure to Soil-Borne Chemicals for Individual Samples from *Step 5 RI Hot Spots*

5.2A Summary of Cumulative Risk and Cumulative Hazard Estimates, and Recommendations for IRM Soil-Removal Actions, for Shallow-Soil Hot-Spot Locations Identified During Steps 1 through 4 of the Soil Remedial Investigation

5.2B Summary of Cumulative Risk and Cumulative Hazard Estimates from Exposure to Soil-Borne Chemicals for Step-5 Hot Spots

5.3 Summary of Cumulative Risk and Cumulative Hazard Estimates from Exposure to VOCs Predicted to Occur in Indoor Air for Site-wide Locations Sampled During RI Steps 1 through 5

6.1 Shallow Soil Vapor Risk Drivers and Proposed Shallow Soil Vapor Action Levels (embedded in text)

6.2 Primary Soil Vapor COPCs and Proposed Deep Soil Vapor Action Levels (embedded in text)

8.1A Summary of Cumulative Cancer Risks and Cumulative Noncancer Hazards at Hot-Spot Locations in Phase I Parcels

8.1B Summary of Cumulative Cancer Risks and Cumulative Noncancer Hazards at Hot-Spot Locations in Phase I Parcels

21

FIGURES

1.1 El Segundo Site Location Map

1.2 Site Layout and Sampling Location Map

1.3 Aerial Photo

2.2.1 Lateral Extent of COPC Exceedance of Soil Matrix SSLs in Shallow Soils (0-10 ft bgs)

2.3.1 Lateral Extent of COPC Exceedance of Soil Vapor SSLs in Shallow Soils (0-10 ft bgs)

2.3.2 Total VOC Soil Vapor Sampling Results (>20 ft bgs)

2.3.3A Carbon Tetrachloride in Soil Vapor (>20 ft bgs)

2.3.3B Chloroform in Soil Vapor (>20 ft bgs)

2.3.4A TCE and cis-1,2-DCE in Soil Vapor, SW Corner Parcel (<10 ft bgs)

2.3.4B TCE and cis-1,2-DCE in Soil Vapor, SW Corner Parcel (>20 ft bgs)

2.3.5A Carbon Tetrachloride in Soil Vapor, Cross Section A-A'

2.3.5B Chloroform in Soil Vapor, Cross Section A-A'

2.3.6A Carbon Tetrachloride in Soil Vapor, Cross Section B-B'

2.3.6B Chloroform in Soil Vapor, Cross Section B-B'

2.3.7 TCE and cis-1,2-DCE in Soil Vapor, SW Corner Parcel, Cross Section F-F'

2.4.1 Chloroform Concentrations in Old Dune Sand Aquifer, Second Quarter 2004

2.4.2 TCE Concentrations in Old Dune Sand Aquifer, Second Quarter 2004

3.1 Proposed Conceptual Phase I Redevelopment Plan

5.2.1 Conceptual Site Model for the Honeywell El Segundo Site

5.2.2 Areas with Potential Indoor Air Concern

8.1 IRM Soil Removal Decision Tree for Soil Matrix Hot Spots

8.2 Hot Spots for IRM Soil Removal

9.1.1 Proposed SVE Well Layout Superimposed on Soil Vapor Sampling Results (40 ft bgs)

9.1.2 Vapor Extraction Well Construction Detail

9.1.3 Cryogenic Vapor Treatment Block Process Flow Diagram

9.2.1 Old Solvents Warehouse Proposed SVE Layout Superimposed on Total VOC Soil vapor Sampling Results

9.2.2 Old Solvents Warehouse Vapor Treatment System Block Process Flow Diagram

9.3.1 Proposed Shallow Soil Vapor Monitoring Well Network

APPENDICES

A Fate and Transport Evaluation to Determine Site-Specific Soil Cleanup Levels for Groundwater Protection

B Risk Assessment to Support the Soil Remedial Action Plan for the Phase I Redevelopment Parcels

LIST OF ACRONYMS, ABBREVIATIONS, AND UNITS

1,1-DCE	1,1-dichloroethene
1,1,1-TCA	1,1,1-trichloroethane
1,2,3-TCP	1,2,3-trichloropropane
1,2,4-TMB	1,2,4-trimethylbenzene
1,3,5-TMB	1,3,5-trimethylbenzene
4-M,2-P	4-methyl, 2-pentanone
ug/kg	microgram per kilogram
ug/L	microgram per liter
ug/m^3	microgram per cubic meter
AOC	area of concern
BBI	Baron Blakeslee Inc.
BMD	bromodichloromethane
bgs	below ground surface
CalEPA	California Environmental Protection Agency
CAS	Chemical Abstracts Service
cis-1,2-DCE	cis-1,2-dichloroethene
CFC	chlorofluorocarbon
CFC-11	trichlorofluoromethane
CFC-12	dichlorodifluoromethane
COPC	chemical of potential concern
CSM	conceptual site model
CVRWQCB	Central Valley Regional Water Quality Control Board
DAF	dilution attenuation factor
DDD	4,4'-dichlorodiphenyldichloroethane
DDE	4,4'-dichlorodiphenyldichloroethylene
DDT	4,4'-dichlorodiphenyltrichloroethane
DLM	Designated Level Methodology
DTSC	Department of Toxic Substances Control
EIR	environmental impact report
EMP	entitlement management plan
ESLs	environmental screening levels
ft	feet
GC/MS	gas chromatograph/mass spectrometer
HCFC	hydrochlorofluorocarbon
HCFC-113	1,1,2-trichlorotrifluorethane
HCFC-22	chlorodifluoromethane
HCFC-141b	1,1-dichloro-1-fluoroethane
HCH	hexachlorocyclohexane
HQ	hazard quotient
IRM	interim remedial measure
kg	kilogram
LARWQCB	Los Angeles Regional Water Quality Control Board
m^3	cubic meter

m^3/kg	cubic meter per kilogram
mg	milligram
mg/kg	milligram per kilogram
mg/kg_{BW}–day	milligram per kilogram body-weight per day
mg/m^3	milligram per cubic meter
ml/min	milliliters per minute
MDL	method detection limit
MS/MSD	matrix spike/matrix spike duplicate
MSL	mean sea level
MTBE	methyl-*tert*-butyl ether
NDMA	n-nitrosodimethylamine
NFA	no further action
ODS	Old Dune Sand Aquifer
OEHHA	Office of Environmental Health Hazard Assessment
PCB	polychlorinated biphenyl
PCDDs	polychlorinated dibenzo-*p*-dioxins or "dioxins"
PCE	tetrachloroethene
PID	photoionization detector
POTW	public operated treatment works
ppmv	parts per million as volume
PRG	USEPA Region IX preliminary remediation goal
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
RAP	remedial action plan
RBCG	risk-based cleanup goals
RI	remedial investigation
RL	reporting limit
SFRWQCB	San Francisco Regional Water Quality Control Board
SSLs	preliminary soil screening levels
SVE	soil-vapor extraction
SVOC	semivolatile organic compound
SW	southwest
TCE	trichloroethene
TDL	Total Designated Level
TPH	total petroleum hydrocarbons
UND	unlined natural depression
USEPA	United States Environmental Protection Agency
VEW	vapor extraction well
VOC	volatile organic compounds
WCBBP	West Coast Basin Barrier Program
WP	work plan

2 5

EXECUTIVE SUMMARY

Honeywell International, Inc. (Honeywell) is providing this *Soil Remedial Action Plan* (RAP) for its property located at 850 South Sepulveda Boulevard in El Segundo, California (the Site), as requested by the Los Angeles Regional Water Quality Control Board (LARWQCB) in its letter dated September 15, 2003 (LARWQCB, 2003). Honeywell has completed decommissioning of the Site to facilitate the redevelopment of the property. Most site facilities have been demolished and the Site will be subject to property divestiture after completion of an Entitlement Management Plan (EMP).

Purpose

The purpose of this RAP is to address Site-wide deep soil matrix impacts and soil vapor detected in the vadose zone, and the shallow soil impacts on Phase I Redevelopment parcels (the 37.2-acre Refrigerant Plant Parcel encompassing Unlined Natural Depression Areas 1 through 3 [UND-1, UND-2 and UND-3] and the 4.7-acre Southwest Corner Lot Parcel). Currently, shallow soil hot spot remediation via the Interim Remedial Measure [IRM] soil removal action is underway for the Phase I Redevelopment parcels. A supplemental shallow soil RAP will be submitted in the future to address the *shallow* (<10 ft below ground surface [bgs]) soil remedial options for the Phase II Redevelopment parcels, which includes the 12.9-acre UND-4 and UND-5 areas. Remediation of Site groundwater will also be addressed in a separate document entitled *Conceptual Groundwater Remedial Action Plan and Data Gap Remedial Investigation Work Plan*, which is being prepared concurrently.

This RAP presents the results of fate and transport modeling of chemicals of potential concern (COPCs), summarizes the human health risk assessment assumptions and conclusions, presents the remedial action objectives, describes the remedial alternatives selection process, and provides a conceptual design of the remedial actions for the Site-wide soil vapor plume and for the shallow soil matrix for the Phase I Redevelopment parcels. It also presents the rationale for remediation of Site media based on location-specific Risk-Based Cleanup Goals (RBCGs). Currently, Honeywell is removing all shallow soils (less than 12 feet bgs) on Phase I Redevelopment parcels with a cumulative risk level exceeding 10^{-5} and total hazard quotient greater than 1 in accordance with the procedures outlined in the LARWQCB-approved *Revised IRM Work Plan* (WP). Fate and transport modeling has been performed to support the development of soil and soil vapor action levels that will be protective of the Site groundwater.

Nature and Extent of Contamination

The COPCs at the Site include inorganics, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs) and petroleum hydrocarbons. Inorganics, SVOCs, pesticides, PCBs and petroleum hydrocarbons have been detected primarily in near surface soil (less than 10 feet bgs). These COPCs occur in localized hot-spots. The hot-spots have been investigated, characterized, and remediated or are planned for remediation where COPC concentrations exceed RBCGs, as noted above.

Due to their presence in subsurface media, VOCs are also present in soil vapor. Carbon tetrachloride and chloroform are detected Site-wide at the greatest frequency at concentrations in excess of soil vapor screening levels. Generally, areas with the highest concentrations of carbon tetrachloride and chloroform also have the highest concentrations of total VOCs. The highest concentrations of total VOCs in both shallow and deep soil vapor were observed in the Bone Yard area. The second highest total VOC concentrations were observed in UND-5.

With few exceptions, the concentration of total VOCs in soil vapor increases with depth. Consistent with the lateral distribution of total VOCs, the highest concentrations of COPCs are found in the Bone Yard, Refrigerant Plant, and a few other areas. The soil vapor plume core beneath Refrigerant Plant/UND-1 has been reduced significantly by the pilot soil vapor extraction (SVE) system, the observed soil vapor distribution is indicative of an old, residual vapor plume with its current center located outside the SVE treatment zone.

COPCs in groundwater occur primarily as two VOC plumes. The largest groundwater VOC plume is in the Old Dune Sand (ODS) Aquifer and associated with the Refrigerant Plant/UND-1 area. The Refrigerant Plan plume consists primarily of chloroform, carbon tetrachloride and chlorofluorocarbons (CFCs). A second ODS Aquifer plume consists primarily of trichloroethene (TCE) and cis-1,2-dichloroethene (cis-1,2-DCE) and is associated with the Southwest Corner Lot Parcel, primarily in the vicinity of the Old Solvents Warehouse area.

Fate and Transport Analysis

Fate and transport assessment was performed to evaluate the behavior of COPCs detected in the Site soil and to support the development of soil and soil vapor action levels protective of groundwater.

A tiered approach was used. The tier 1 screening evaluation was performed using the Designated Level Methodology (DLM) developed by the Central Valley RWQCB. The primary objective of the DLM screening was to narrow the list of COPCs warranting further tier 2 evaluation through VLEACH modeling. A total of 26 organic compounds and 3 metals in 10 subareas exceed their Total Designated Level (TDL) concentrations out of the 124 initial COPCs identified in the Soil RI Report. Fourteen organic compounds from Phase I Redevelopment parcels failed the DLM screening.

Vadose zone modeling using VLEACH was conducted for those COPCs that failed the DLM screening. For the shallow soil, VLEACH modeling was also limited to COPCs for the Phase I Redevelopment parcels. The objective of the VLEACH modeling was to evaluate the future impact to groundwater from COPCs in vadose zone soil and to establish the soil cleanup levels for these COPCs to ensure compliance with applicable water quality goals for groundwater protection.

The VLEACH modeling results show that at completion of the ongoing shallow soil hot spot removal action, the residual levels of COPCs in all shallow soil on the Phase I Redevelopment parcels will not pose a threat to groundwater. Potential impact from the site-wide shallow soil vapor on groundwater was also evaluated. These action levels are compared with the corresponding risk-based action levels and the more stringent of the two are proposed as the final action levels. For COPCs in site-wide deep soil and soil vapor, carbon tetrachloride and

chloroform are the only two COPCs that could potentially cause unacceptable impacts on groundwater. A set of action levels were derived for the deep soil and soil vapor based on the VLEACH modeling for the two compounds. The only issue not addressed in this RAP the potential impact from the shallow soil hot spots on Phase II parcels. The evaluation to address the shallow soil hot spots on Phase II parcels will be presented in a supplement RAP in the near future.

Human Health Risk Assessment

The land-use scenario evaluated in the risk assessment presumes redevelopment of the Site will be directed towards establishment of a "big box" development (large retail operations) consisting of various commercial retail buildings (*e.g.*, home improvement center, warehouse-type discount store, *etc.*), smaller businesses, and parking. All structures are planned as slab-on-grade, with no subsurface features (basements or underground parking). A deed restriction will be recorded on title, and no development will ever include residential land redevelopments such as daycare centers, churches, assisted-living centers, or residences.

Based on the established future land use, the risk assessment evaluated four potential receptors—the Outdoor Non-Intrusive Worker, Excavation Worker, Child Shopper and Indoor Worker—who may be exposed to COPCs in near surface soil (10 feet bgs or less) and/or soil vapor. Exposure pathways to groundwater were not considered complete and were not evaluated in the risk assessment because the depth-to-groundwater is 80 feet and groundwater is not used for drinking or household/commercial purposes because of its high salt content.

The chemical-concentration results collected during the RI (through Step 5) were screened against a first tier of a suite of values to evaluate whether the measured concentrations of COPCs at a location exceeded certain risk-management indicators, including USEPA Region 9 Preliminary Remediation Goals (PRGs), the Environmental Screening Levels (ESLs) developed by the SFRWQCB; LARWQCB screening levels for protection of groundwater; potential threats to groundwater due to migration of COPCs from vadose zone soil to groundwater based on the DLM; background concentrations for inorganics; and LARWQCB screening-levels for petroleum hydrocarbons. Locations with chemical concentrations that exceeded the most stringent of any of these indicators were identified as *potential* "hot-spot" locations for location-specific risk assessment.

Forty-six potential shallow (<12-ft bgs) soil hot-spot locations were identified in the first-tier RI screening using a set of conservative SSLs. Of those, forty-three potential hot spots are located on Phase I Redevelopment parcels and three located on Phase II Redevelopment parcels. Location-specific cumulative risks and hazard indices (HIs) were calculated for each of the forty-three potential hot spots for the Phase I Redevelopment parcels in accordance with the procedure presented the LARWQCB-approved *Revised Goals Report* and the *Revised IRM WP*. Of the forty-three potential hot spots, twenty-three locations were determined to either pose unacceptable risks (cumulative risk>10^{-5} or HI>1) or concentrations of certain inorganics exceeded their background level. Shallow soils from these 23 risk-based hot spots are the targets of executed, ongoing, and planned IRMs to reduce the residual COPC concentrations to levels below RBCGs for organics or background levels for inorganics. When these IRMs are complete,

the residual risks for all Phase I Redevelopment parcels would be below the risk-management target values for cumulative risk (*i.e.*, $\leq 10^{-5}$) or cumulative hazard (HI≤1) and no further remedial attention would be necessary with respect to the shallow soil.

Remedial action plan including a tier-2 risk evaluation will be submitted in the future for the three potential shallow soil hot spots located on the Phase II Redevelopment parcels.

Risk and hazard estimates have also been calculated for soil-vapor locations sampled Site-wide (on both Phase I and Phase II Redevelopment parcels) during the Soil RI. The results of the risk assessment indicate that generally three areas Site-wide are above the risk-management target values for cumulative risk (*i.e.*, $>10^{-5}$) or cumulative hazard (HI>1) and further evaluation or remedial actions should be considered for these areas. Differing from soil hot spots (most of which are discrete locations with limited lateral and vertical extents of contamination), the vapor hot spots encompass relatively large areas. Therefore, the location-specific risk assessment approach provides the most conservative assessment for potential risks from the soil vapor. This is evident from mapped extent of locations where cumulative risks exceeded 10^{-5} or an HI>1. The areas with unacceptable risks overlap the vapor plumes for the critical risk-driver chemicals (carbon tetrachloride and chloroform).

Remedial Action Objectives and Proposed Action Levels

The remedial action objectives for the Site soils are summarized as:

- Protect human health by reducing the risks associated with (a) direct contact with contaminated soils, and (b) potential inhalation of vapors and dusts in indoor and outdoor air from COPCs in shallow soils; and
- Prevent degradation of groundwater by removing COPCs from deep soils.

Remedial actions should take place in such a way and in a timeframe to not impede property development; they should allow development to proceed safely and efficiently.

Action levels for shallow soils are based on RBCGs calculated for each location to ensure the cumulative risk is less than 10^{-5} and the HI is less than 1. The RBCGs have been estimated for each shallow soil hot spot and the ongoing IRM soil removal action will cleanup all the shallow soil that would pose unacceptable risks as demonstrated by the risk assessment. In addition, fate and transport evaluation has verified that the RBCGs are also protective of groundwater.

Action levels for shallow soil vapor were estimated by both a risk-based approach and the fate and transport analysis for primary VOCs at the Site. Similar to the shallow soil, the risk-based action levels are much more stringent than those for groundwater protection and therefore are considered the final action levels for the shallow soil vapor. Carbon tetrachloride, chloroform and TCE are the three primary risk drivers for the most critical risk exposure scenario - indoor workers exposed to vapors migrating into the indoor air. However, there is no single location where all three risk drivers are co-located. Thus, a range of action levels has been calculated for each risk-driving chemical assuming either one or all three chemicals is present.

The low action levels are appropriate for locations where all three risk driver VOCs are co-located; the high action levels are appropriate where only one risk driver is present. For

05 2003608

example, the action level for carbon tetrachloride would be 54 ug/L at locations where carbon tetrachloride is the only risk driver. At locations where all three VOCs are present and each contributes 1/3 of the risk, the action level for carbon tetrachloride would be 18 ug/L. Proposed action levels for the shallow soil vapor are summarized in the following table.

Proposed Action Levels for the Shallow Soil Vapor (<10 ft)

COPC	Risk at the Unit Soil-Vapor Concentration (=1 ug/L) [1]	Proportional Contribution To The Target Risk Level (10^{-5})		Shallow Soil Vapor Action Levels (ug/L)	
		Three Risk Drivers	One Risk Driver	Three Risk Drivers (Lo)	One Risk Driver (Hi)
Carbon Tetrachloride	1.84E-07	1E-5 / 3	1E-5	18	54
Chloroform	2.98E-08	1E-5 / 3	1E-5	112	336
TCE	8.90E-09	1E-5 / 3	1E-5	374	1124

[1] From Appendix B, Table 11; this is the most-stringent value of all the exposure scenarios.

Action levels for the deep soil and deep soil vapor plume are based entirely on potential impact to groundwater. Based on the fate and transport analysis, none of the COPCs detected in deep soil matrix in Phase I Redevelopment parcels have the potential to impact groundwater. VLEACH modeling has derived a set of action levels for primary VOCs found in the deep soil vapor for eight VOCs that were detected at high frequency and relatively high concentrations in comparison with their corresponding water quality goals. Carbon tetrachloride and chloroform are the only two VOCs in deep soil vapor for which the modeled cleanup levels for groundwater protection are lower than the actual observed soil vapor concentrations. Therefore, remedial action may be necessary to reduce their concentrations to levels protective of groundwater. Those action levels are summarized in the table below. Because of the coarse-grained soil and the high volatility of both compounds, meeting the soil vapor cleanup levels should also meet the soil matrix cleanup goals.

Primary Soil Vapor COPCs and Proposed Deep Soil Vapor Action Levels

Chemicals Of Concern	Water Quality Goal (WQG) (ug/L)	WQG Source	Average *Deep Soil Vapor* Action Level to Meet WQG (ug/L)
Carbon Tetrachloride	0.5	CA. Primary MCL	107
Chloroform	100	LARWQCB	2,512

Remedial Technology Screening

Soil removal and offsite disposal are the most effective remedy for the shallow soil hot spots compared with many *in situ* and onsite treatment technologies. The co-presence of many families of COPCs in the Site soil makes most *in situ* and onsite treatment options impractical or

30

not cost effective. Because almost all soil hot spots are located within 10 ft of the ground surface and the entire Site is accessible (facility structures have been completely demolished), soil excavation and offsite disposal is technically feasible and cost effective. The remediation can also be implemented in a short time to facilitate the pending site development.

Technology options to remediate the vapor plume are limited and SVE is the USEPA presumptive remedy for vapor plume remediation. Due to the sandy soil condition of the Site, SVE is a favorable candidate for the vapor plume cleanup. In addition, the pilot SVE system implemented in the Refrigerant Plant has proven its applicability and efficacy for removing VOC soil vapors from the vadose zone. The SVE system operated between 2000 and 2004 as part of an interim remedial action (IRM). The pilot SVE system was installed in accordance with the LARWQCB approved Interim Corrective Action Plan. In a little more than three years, the pilot SVE system removed an estimated 110,000 pounds of VOCs.

Remedial Action Plan for Impacted Soil and VOC Vapor Plume

The removal option selected for shallow soil is excavation. Under this remedial option, the contaminated shallow soil is excavated and removed from the Site. Excavation will be followed by treatment and/or disposal of the contaminated soil. All Phase I shallow soil hot spots will be cleaned up via IRM in accordance with the LARWQCB-approved *Revised IRM WP*. Remediation of the shallow soil for the Phase II Redevelopment parcel will be covered in a supplemental RAP.

SVE was selected as the most technically sound and cost effective method for removing VOCs from unsaturated shallow and deep soils at the Site. Remediation of soil vapor by SVE has been successfully demonstrated by a pilot SVE study in the Refrigerant Plant source area. The proposed Site-wide soil vapor remedial action will consist of installation of additional vapor extraction wells to cover the extent of the vapor plume exceeding action levels. A conceptual extraction layout has been developed in this RAP. Precise well locations, screened intervals and operational parameters are subject to revision during the detailed design. Additional pilot tests on individual may be conducted for individual wells to support the detailed design. Final design and as-built drawings for the expanded SVE system will be presented in an SVE system start-up and initial performance assessment report. Operating procedures for the system will be subject to ongoing testing and optimization.

If necessary, vapor barriers will be installed in buildings constructed in areas where SVE has not reduced shallow soil vapor levels below risk management targets by the time of construction. In addition, soil vapor monitoring wells will be installed near buildings to track vapor concentrations in the shallow soil so that timely response actions, if needed, can be taken to prevent unacceptable exposures. If warranted, an updated risk assessment will be performed using the vapor monitoring data at that time to verify if vapor intrusion will still be a concern prior to the site redevelopment.

One SVE well is also proposed for the Old Solvents Warehouse area although VOC vapor concentrations are lower than action levels. The system will be installed as part of a proposed pilot air sparging treatment system to remediate the VOC source zone near the water table.

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Details for the air sparging system are included in the conceptual groundwater remedial action plan which is being prepared concurrently.

3 1

1 INTRODUCTION

1.1 PURPOSE

Honeywell International, Inc. (Honeywell) has prepared this *Soil Remedial Action Plan* (RAP) for the El Segundo Site (the Site) located at 850 South Sepulveda Boulevard in El Segundo, California, as requested by the Los Angeles Regional Water Quality Control Board (LARWQCB) in its letter dated September 15, 2003 (LARWQCB, 2003).

The Site will be subject to property divestiture after completion of an Entitlement Management Plan (EMP). Currently, shallow soil hot spot remediation is underway for the Phase I Redevelopment parcels, which include the 37.2-acre Refrigerant Plant Parcel encompassing Unlined Natural Depression Areas 1 through 3 (UND-1, UND-2 and UND-3) and the 4.7-acre Southwest (SW) Corner Lot Parcel (see Section 1.2). This RAP addresses the shallow soils for the Phase I Redevelopment parcels and the Site-wide vapor plume and deep soils. A supplemental RAP will be submitted in the future to address the shallow soil remedial options for the Phase II Redevelopment parcel, which includes the 12.9-acre UND-4 and UND-5 areas. Remediation of Site groundwater is addressed in a separate document entitled *Conceptual Groundwater Remedial Action Plan and Data Gap Remedial Investigation Work Plan* which is under concurrent preparation.

This RAP provides a summary of the remedial investigation (RI) findings for the Site soil, describes a tiered screening process to identify the shallow soil hot spots and the vapor plume for remediation, presents remedial action goals (RAOs) and action levels that are protective of human health and the environment, describes the remedial alternatives selection process, and provides a conceptual design of the remedial actions for the Site-wide soil vapor plume and for the shallow soil matrix of the Phase I Redevelopment parcels.

As detailed in the *Soil Remedial Investigation Report* ("Soil RI Report" - Parsons 2004d), the site soil has been thoroughly characterized through a phased RI approach, which involved extensive sampling and analysis of the Site soil. A systematic approach was used to identify the chemicals of potential concern (COPCs) for the Site using a set of soil screening levels (SSLs). The SSLs were conservative screening levels used to support the characterization of the nature and extent of Site-related chemicals and are not "action levels" for remedial actions. Action levels are determined by risk assessment and fate and transport modeling to ensure protection of human health and groundwater. Risk assessment derives location-specific Risk-Based Cleanup Goals (RBCGs), which serve as the action levels to guide the remediation of the shallow soil (less than 12 feet below ground surface [bgs]). Fate and transport modeling derives action levels for the deep soil and vapor plume to ensure groundwater protection.

In addition to the Soil RI Report (Parsons, 2004d) and *Addendum – Step 5 Results for the Soil Remedial Investigation Report* ("RI Report Addendum" – Parsons, 2004f), key documents that preceded and served as the basis for this RAP include the *Risk-Based Cleanup Goals for Interim Remedial Measures* ("Revised Goals Report" - Parsons, 2004c), the *Revised Phase I Site Redevelopment Shallow Soil Interim Remedial Measures Work Plan* ("Revised IRM WP" Parsons, 2004b). The Los Angeles Regional Water Quality Control Board (LARWQCB) has reviewed and approved the Soil RI Report, the *Revised Goals Report* and the *Revised IRM WP*. The *Revised Goals Report* presented a process by which the risk assessment is conducted for this project and set the target risk levels to support remedial action decisions. The *Revised IRM WP*

presented a plan by which soil removal actions are implemented in accordance with the RBCGs derived from the risk assessment. Currently, Honeywell is removing all shallow soil hot spots derived from a tiered process: Tier 1 RI screening using conservative SSLs and Tier 2 risk assessment to derive location-specific RBCGs for soil and soil vapor remediation to reduce the risk levels to below the cumulative target risk level of 10^{-5} and total hazard index (HI) of 1. Shallow soil removal action has been implemented as an interim remedial measure (IRM) in accordance with the LARWQCB-approved, *Revised IRM WP* (Parsons, 2004b). This RAP provides a comprehensive plan to ensure the ongoing IRM removal action will achieve the RAOs for the shallow soil for the Phase I Redevelopment Parcels and the expansion of the pilot soil vapor extraction (SVE) system will achieve the RAOs for the site-wide deep soil and soil vapor vapor plume.

1.2 SITE DESCRIPTION AND HISTORY

The Site is located in an area of heavy industry and commercial properties and is bounded by Sepulveda Boulevard to the west, numerous commercial and industrial facilities to the north and east, and Rosecrans Boulevard to the south. All operations ceased at the Site facilities in February 2003, demolition of site structures is complete and remedial activities are ongoing. The Site location is shown on Figure 1.1. The Site layout and parcel boundaries are shown on Figure 1.2.

The Site consists of three parcels—the 37.3-acre Refrigerant Plant Parcel, which includes Unlined Natural Depressions 1 through 3 (UNDs 1 through 3), the 12.9-acre UND-4 and -5 Parcel and the 4.7-acre Southwest Corner Lot (SW Corner Lot) Parcel. The five UNDs were used to collect and contain surface runoff and wastewater from Site operations between 1920 and 1974. Beginning in 1974, wastewater was treated on site and discharged to a publicly owned treatment works (POTW) receiving location. As the industrial operations changed through time, selected UND areas were filled with a combination of solid wastes and soils produced during the construction of new operational facilities. The *Soil Remedial Investigation Report* (Soil RI Report, Parsons, 2004d) presents a detailed discussion of the historical industrial operations at the Site.

Honeywell has completed decommissioning of the Site facilities and structures to facilitate the eventual redevelopment of the property. Site facilities have been demolished and removed per the Site Management Plan (Mactec, 2003). Specific historic uses and existing features of the three parcels are described in the following sections.

1.2.1 Refrigerant Plant Parcel

The Refrigerant Plant Parcel forms the north/northwestern portion of the Site. It contains UND-1, UND-2, and UND-3 and several former plant production areas. UNDs 1 through 3 are natural depressions with limited vegetative cover that formerly received surface runoff and wastewater from Site operations. Over the years some areas within the UNDs were filled with a combination of the solid wastes, construction debris and soil produced during the construction of new operations. Phthalic anhydride waste was stored in a pile in the northwest corner of UND-3.

The northwest, north-central, and northeast portions of the parcel, referred to as subareas NW, Bone Yard, and NE, are mostly covered with low grass and brush. The former refrigerant and phthalic anhydride plants were demolished and are now covered by gravel.

The only above-ground structure that remains on the Refrigerant Plant Parcel is the guard house and the offices near the front gate. A temporary trailer is located at the Site adjacent to the offices to serve as restroom facilities for Site workers. Some asphalt remains in this area. All other concrete and asphalt has been removed except for an asphalt road near the Site exit to Allied Way and an asphalt road that extends from grid point C09 to E02.

Excavation of shallow soil hot spots determined to have excess human health risk is currently under way on this parcel in accordance with the *Revised IRM WP* (Parsons 2004b).

1.2.2 UND-4 and -5 Parcel

The UND-4 and -5 Parcel forms the southeastern portion of the Site. UNDs 4 and 5 are natural depressions that formerly received surface runoff and waste from Site operations. Additionally, UNDs 4 and 5 received untreated solid wastes and wastewater including acidic carbon from sulfuric acid production, tailings from the Sulfuric Acid Regeneration (SAR) process, and tailings wastes from the General Chemical Company pesticide plant. SAR tailings consist of fine to coarse sand sized granular, carbon-like materials (Brown and Caldwell, 1996b). These carbon wastes are also identified in many of the soil boring logs from the Step 1 through Step 4 RI soil sampling activities and have been compiled in Appendix C of the Soil RI Report (Parsons, 2004d). The areas where carbon wastes and other non-native wastewater sediment-related materials were encountered during Step 1 through Step 4 RI soil sampling corresponds directly to where wastewater ponding was observed in historical aerial photos. The area is covered by limited vegetation such as ice plants, grasses and sparse shrubs. No structures were present on this parcel.

Because this parcel is part of the Phase II Redevelopment Program, shallow soil hot spots, although defined through the RI, will be addressed in a supplemental RAP at a late time.

1.2.3 SW Corner Lot Parcel

The SW Corner Lot Parcel is the location of a portion of the wastewater treatment system (wastewater storage tanks and polishing carbon beds), the former sulfuric acid plant, the former sulfur recovery unit, and the former old solvents warehouse. All above-ground structures on this parcel have been demolished.

Excavation of shallow soil hot spots determined to have excess human health risk is currently under way on this parcel in accordance with the *Revised IRM WP* (Parsons 2004b).

1.3 GEOLOGY AND HYDROGEOLOGY

The Site is located in the western portion of the Los Angeles Basin, which is characterized by a coastal belt of Pleistocene-age, stabilized dunes and sand deposits known as the El Segundo Sand Hills. The land surface at the Site is uneven, ranging from 85 ft above mean sea level (msl) in the five UNDs to over 140 ft above msl at the southwest corner of the Site. The average elevation is approximately 100 ft above msl. Surface drainage comprises an essentially closed system; the amount of rainfall runoff that leaves the Site is negligible. Surface features of the Site are shown on the aerial photograph in Figure 1.3.

Groundwater at the Site is first encountered at approximately 80 to 100 feet bgs. The vadose zone consists of relatively uniform dune sands from the ground surface to the top of

groundwater. Several previous reports including the Soil RI (Parsons 2004d) provide additional information about the geology and hydrogeology of the Site.

1.4 SITE INVESTIGATIONS

Since 1996, several phases of investigation and groundwater monitoring have been conducted at the Site (Brown and Caldwell, 1996a, 1996b, 1998, 2001a, and 2001b; Parsons 2001b). In 2000, Honeywell installed an SVE system to remediate VOCs in the vadose zone beneath the Refrigerant Plant area (Parsons, 2001b). Since May 2001, Honeywell has conducted additional RI activities in accordance with the LARWQCB-approved *Groundwater and Soil Remedial Investigation Work Plan* (Parsons, 2001a) which have been documented in subsequent reports (Parsons, 2001c and 2002). Three reports provide soil matrix-quality data, the *Phase I Site Assessment Report* (Brown and Caldwell, 1996b), *Phase II Soil and Groundwater Quality Assessment Report* (Brown and Caldwell, 1998) and most recently, the Soil RI and the Addendum reports (Parsons, 2004d,f). Relevant historical soil matrix and soil vapor data from the historical reports have been compiled in Appendix A of the Soil RI Report (Parsons, 2004d).

Approximately 440 shallow soil borings were completed as part of the step-wise soil RI (Step 1 through Step 5). Excluding quality-control samples, approximately 1378 samples were analyzed for volatile organic compounds (VOCs - by USEPA Method 8260B), 1129 samples were analyzed for semivolatile organic compounds (SVOCs - USEPA Method 8270C), 1107 samples were analyzed for pesticides (USEPA Method 8010), 1048 samples were analyzed for polychlorinated biphenyls (PCBs - USEPA Method 8020), 1060 samples were analyzed for inorganics (USEPA 6000/7000–series Method), and 1160 samples were analyzed for full-scan total petroleum hydrocarbons (TPH - USEPA Method 8015M). During Steps 1 through 4, a select set of samples were analyzed for emerging chemicals (perchlorate, NDMA, 1,2,3-TCP, and 1,4-dioxane) as well as furan, dioxin and hexavalent chromium (Cr^{+6}). Approximately 353 soil vapor samples were collected and analyzed for VOCs by a mobile laboratory (USEPA Method 8260B).

Approximately 120 shallow and 201 deep soil vapor samples were collected from approximately 132 Site-wide locations (36 deep locations) during Steps 1 through 5. Consistent with the definition for shallow soil, shallow soil vapor samples are defined as any sample collected from 10 ft bgs or less. Deep soil vapor samples are defined as any sample collected from greater than 20 ft bgs. Soil vapor samples were typically analyzed onsite by a State-certified laboratory with select samples analyzed in off-site laboratories for quality control purposes.

Locations of soil matrix and soil vapor samples are shown on Figure 1.2. All soil and soil vapor data from investigations and reports prior to February 2004 are presented and summarized in the Soil RI (Parsons, 2004d). Additional shallow and deep soil and soil vapor data gap investigations were performed between April and August 2004. The findings of those investigations are presented in the *Addendum- Step 5 Results for the Soil Remedial Investigation Report* (Parsons, 2004f). The tables and figures contained in this RAP have incorporated findings and data from these two recent reports.

1.5 HISTORICAL SITE REMEDIATION

A number of remedial activities have been completed to date at the Site. The following subsections describe those activities which have occurred on the Phase I Redevelopment parcels.

1.5.1 Remediation of Chloroform Spill

In 1988, a 14,000-gallon spill of chloroform occurred at the eastern part of Refrigerant Plant near UND-1. Honeywell excavated approximately 3,000 cubic yards of soils in the spill area. The excavated soil was stockpiled in a lined treatment cell in the eastern part of UND-1 and was treated subsequently to reduce chloroform to below 110 milligrams per kilogram (mg/kg) (OHM, 1989).

Subsurface soils from the spill area were analyzed for chloroform: the results indicated that chloroform was still present at up to 260 mg/kg in samples collected from 20 feet bgs (OHM, 1989).

1.5.2 Soil Cover in UND-5

Clean fill soil cover was placed over UND-5 on two different occasions during the late 1970's and early 1980's after wastewater operations ceased. This can be seen by comparing the 1974 and 1991 aerial photographs presented in Appendix A2. Approximately one foot of clean fill was placed and compacted over previously-deposited carbon wastes to prevent potential air-borne transport of those materials. A total of approximately 120,000 cubic yards of imported fill was used at UND-5. Imported soils were derived from soil excavation activities related to the construction of the nearby interstate freeways. According to former plant employees, imported soils were analyzed and certified as "clean" per the regulations effective at that time. The fill project was permitted and approved by the City of El Segundo (Whitson-Svitana, personal communication, 2004).

1.5.3 Soil Vapor Extraction

In 2000, Honeywell installed an SVE system to remediate VOCs in the vadose zone at the Refrigerant Plant (Parsons, 2001b) including the chloroform-impacted soil in UND 1. The SVE system was implemented in accordance with the Interim Corrective Action Plan (ICAP) prepared jointly by Parsons and Brown and Caldwell (Brown and Caldwell and Parsons Engineering Science, Inc., 1999). Since its startup in October 2000, the system has removed approximately 110,000 pounds of VOCs and resulted in a 90-percent reduction of VOC concentrations in nearly all of the extraction wells. The system was shut down and dismantled in 2004 to accommodate demolition of the Site structures. It will be modified for full-scale implementation in accordance with this RAP (Section 9).

1.6 SITE DEMOLITION ACTIVITIES AND INTERIM SOIL REMOVAL ACTION

The Site structures were decommissioned and demolition activities were completed in June 2004 per the procedures described in the *El Segundo Site Management Plan* (Mactec, 2003). During Site demolition activities, additional judgmental sampling was performed in the former facility area (the source area) of impacted soils under foundations, equipment, or utilities. The procedures used for addressing potentially impacted soil discovered during demolition were the same as those used for the ongoing RI sampling and are described, in part, in the *Revised IRM WP* (Parsons, 2004b). Potential hot spots identified during demolition support sampling were further delineated during Step 5 activities and discussed in Section 5.3 of the Addendum Step 5 Report (Parsons, 2004e). Potentially identified hot spots will be addressed through risk

assessment described in the *Revised Goals Report* (Parsons, 2004c) and the *Revised IRM WP* (Parsons, 2004b).

Implementation of the *Revised IRM WP* is currently underway. Honeywell is excavating the shallow soil hot spots and conducting confirmatory sampling in each excavation. The results of this work will be published in an IRM Completion Report.

2 REMEDIAL INVESTIGATION FINDINGS

2.1 IDENTIFICATION OF SITE-RELATED CHEMICALS AND CHEMICALS OF POTENTIAL CONCERN

Based on a review of chemicals used, stored, and manufactured during historic operations of the Site, the following classes of analytes could potentially be present in Site soils and groundwater:

- VOCs
- SVOCs
- Pesticides
- Inorganics
- PCBs
- TPH

Laboratory analyses of soils and soil vapor samples collected during the Step 1 through Step 5 and previous investigations were screened to determine if any chemical from these classes of analytes was detected at a concentration in excess of its respective method detection limit (MDL). Table 2.1.1 presents the results of this screening. Table 2.1.1 indicates the number of samples collected, the number of positive detections observed, and the maximum concentration for each compound. If a compound was not detected at least once at a concentration in excess of the MDL, it was eliminated from consideration as a COPC.

Table 2.1.2 provides a list of those compounds in each class of analytes that were initially retained as Site COPCs.

A detailed description of the shallow soil screening levels can be found in the Soil RI Report (Parsons, 2004d). Tables 2.1.3 and 2.1.4 list the soil screening levels for VOCs for soil and soil vapor respectively.

2.2 COPC DISTRIBUTION IN SOIL

2.2.1 Summary of Shallow Soil Matrix Investigation Findings

The following subsections describe the nature and extent of impacted shallow soils at the Site. Discussions in the following subsections are limited to those COPCs that had at least one detection above the MDL at a concentration in excess of the SSL.

Data presented in this discussion include samples collected during Step 1 through Step 5 grab sampling activities as well as relevant historical data. Additional data collected during Step 5 is presented in the Addendum Step 5 RI Report (Parsons 2004e). Each subsection includes a summary of samples and results where the observed concentration for a particular COPC was detected in excess of the SSL. Table 2.2.1 lists the potential soil hot spot areas and COPC classes that exceeded SSLs in each area. Figure 2.2.1 is a Site map that shows the locations of the potential hot spot areas and shallow soil SSL exceedances information. Relevant historic data summaries can be found in the Soil RI Report (Parsons, 2004d).

2.2.1.1 VOCs

Approximately 1298 shallow soil samples were collected from approximately 468 locations Site-wide for VOC analysis during Step 1 through Step 5 activities. Based on the SSL evaluation process described in the Soil RI Report (Parsons 2004d), the following fifteen VOCs were

selected for further evaluation based on their detection frequency and relative concentration with respect to the most stringent SSL for each of these compounds (SSLs in parentheses):

- 1,1-dichloroethene (1,1-DCE; 1,020 ug/kg)
- 1,2,4-trimethylbenzene (1,2,4-TMB; 11,900 ug/kg)
- 4-methyl, 2-pentanone (4-M,2-P; 27,200 ug/kg)
- benzene (170 ug/kg)
- 1,3,5-trimethylbenzene (1,3,5-TMB; 2,040 ug/kg)
- bromodichloromethane (BDM; 39 ug/kg)
- carbon tetrachloride (35 ug/kg)
- methyl-t-butyl ether (MTBE; 2,210 ug/kg)
- chloroform (270 ug/kg)
- ethyl benzene (13,000 ug/kg)
- naphthalene (1,054 ug/kg)
- tetrachloroethene (PCE; 250 ug/kg)
- toluene (25,500 ug/kg)
- trichloroethene (TCE; 110 ug/kg)
- total xylenes (xylenes; 100,000 ug/kg)

The following summarizes the VOC sample results where individual COPCs were detected at concentrations in excess of the SSL.

Subarea	Depth Interval (ft bgs)	Sample Location	Sample ID	COPC (concentration in ug/kg)
BONE YARD	4-6 Ft	SB-PIRM-9	BD112503-A	Chloroform (340)
	8-10 Ft	SB-B13	SB-B13-3	Chloroform (2400)
ORTHO-XYLENE	4-6 Ft	SB-I03-D	SB-I03-D-2	Chloroform (2100)
	0-0.5 Ft	Demo-WWSWTS-2	Demo-WWSWTS-2-1	Chloroform (19000)
	0-0.5 Ft	Demo-WWSWTS-3	Demo-WWSWTS-3-1	Chloroform (18000), Xylenes (1600000)
PHTHALIC ANHYDRIDE	0-0.5 Ft	Demo-PAA-1	Demo-PAA-1	Xylenes (1800000)
REFRIGERANT PLANT	0-0.5 Ft	SB-D09-D4	SB-D09-D4-1	Carbon Tetrachloride (170)
	4-6 Ft	SB-E09-D	SB-E09-D-2	1,1 DCE (1900)
	4-6 Ft	SB-F07-D	SB-F07-D-2	Carbon Tetrachloride (39)
	4-6 Ft	SB-GPA-5	SB-GPA-5-2	Carbon Tetrachloride (91)
	8-10 Ft	SB-GPA-5	SB-GPA-5-3	Carbon Tetrachloride (97)
	8-10 Ft	SB-HBTLS-3	SB-HBTLS-3	TCE (210)
SW CORNER LOT	8-10 Ft	SB-M03-D	SB-M03-D-3	TCE (140)
	0-0.5 Ft	Demo-BS-1	Demo-BS-1	Naphthalene

Subarea	Depth Interval (ft bgs)	Sample Location	Sample ID	COPC (concentration in ug/kg)
UND-2	0-0.5 Ft	SB-F06-D	SB-F06-D-1	PCE (7100)
UND-4	4-6 Ft	SB-M06	SB-M06-2	Carbon Tetrachloride (73), TCE (350)
		SB-M06-A3	SB-M06-A3-2	Ethylbenzene (1400)
UND-5	0-0.5 Ft	SB-K15	SB-K15-1	BDM (400), Carbon Tetrachloride (1000), Chloroform (450), PCE (4600), TCE (14000)
		GP-5	GP5-SV33-1A	Carbon Tetrachloride (110)
	4-6 Ft	SB-J12	SB-J12-2	Carbon Tetrachloride (72)
		SB-J13	SB-J13-2	1,2,4-TMB (29000), Ethylbenzene (350000), Xylenes (220000)
		SB-J14	SB-J14-2	Benzene (1100), 1,3,5-TMB (11000), Carbon Tetrachloride (4400), Chloroform (2500), Ethylbenzene (200000), Naphthalene (2500), TCE (1000), Xylenes (289000)
		SB-J15	SB-J15-2	Ethylbenzene (14000)
		SB-K11	SB-K11-2	Carbon Tetrachloride (85)
UND-5	4-6 Ft	SB-K12	SB-K12-2	Benzene (260), Carbon Tetrachloride (1700), Chloroform (5100), Ethylbenzene (22000), Naphthalene (2000), PCE (300)
		SB-K13	SB-K13-2	BDM (65), Carbon Tetrachloride (780), Chloroform (3200), PCE (270), TCE (400)
		SB-K14	SB-K14-2	4-M, 2-P (44000), 1,3,5-TMB (8700), Chloroform (4200), MTBE (11000), Ethylbenzene (590000), Toluene (26000), Xylenes (660000)
		SB-K15	SB-K15-2	4-M, 2-P (170000), 1,3,5-TMB (10000), Ethylbenzene (1700000), Toluene (47000), Xylenes (2220000)
		SB-L12	SB-L12-2	1,3,5-TMB (2500), Carbon Tetrachloride (2500), Chloroform (7600), MTBE (42000), Ethylbenzene (260000), TCE (680), Xylenes (340000)
		SB-L13	SB-L13-02	1,3,5-TMB (3800), Carbon Tetrachloride (1800), Chloroform (5600), Ethylbenzene (710000), Xylenes (980000)
		SB-L14	SB-L14-2	Chloroform (2900), Ethylbenzene (160000), Xylenes (147000)
UND-5		SB-L15	SB-L15-02	1,3,5-TMB (6000), Carbon Tetrachloride (500), Ethylbenzene (56000), TCE (210), Xylenes (123000)
		SB-M13	SB-M13-2	Carbon Tetrachloride (640), Ethylbenzene (220000), Xylenes (245000)
		SB-M14	SB-M14-2	1,3,5-TMB (4200), Ethylbenzene (370000), Xylenes (600000)
	5-7 Ft	SBD-I14-A	SBD-I14-A-1	Carbon Tetrachloride (700), TCE (120),
		SBD-J12-C1	SBD-J12-C1-1	1,3,5-TMB (2800), Carbon Tetrachloride (3500), Chloroform (8300), Ethylbenzene (360000), Naphthalene (4200), TCE (2900), Xylenes (590000)

Subarea	Depth Interval (ft bgs)	Sample Location	Sample ID	COPC (concentration in ug/kg)
		SBD-K13-B	SBD-K13-B-1	Carbon Tetrachloride (390), Chloroform (3800), Ethylbenzene (56000), TCE (260), Xylenes (101000)
		GP-5	GP5-SV33-5A	Carbon Tetrachloride (170), Chloroform (470)
		SBD-M13-C1	SBD-M13-C1-1	Carbon Tetrachloride (140), Ethylbenzene (34000)
	8-10 Ft	TB-1	TB1-UND5-10	Ethylbenzene (130000), Xylenes (140000)
		GP-5	GP5-SV33-10	Carbon Tetrachloride (37)
		SB-J13	SB-J13-3	Ethylbenzene (42000)
		SB-J14	SB-J14-3	1,3,5-TMB (4000), Ethylbenzene (140000), Xylenes (159000)
		SB-K14	SB-K14-3	1,3,5-TMB (2800), MTBE (5000), Ethylbenzene (160000), Xylenes (180000)
		SB-K15	SB-K15-3	4-M, 2-P (57000), 1,3,5-TMB (3600), MTBE (14000), Ethylbenzene (340000), Xylenes (420000)
		SB-L12	SB-L12-3	Ethylbenzene (90000), Xylenes (138000)
		SB-L13	SB-L13-03	Ethylbenzene (110000), Xylenes (145000)
		SB-L14	SB-L14-3	Ethylbenzene (79000),
		SB-L15	SB-L15-03	1,3,5-TMB (2700), Carbon Tetrachloride (240), Ethylbenzene (22000), TCE (120),
		SB-M13	SB-M13-3	Ethylbenzene (180000), Xylenes (196000)
		SB-M14	SB-M14-3	Ethylbenzene (92000), Xylenes (169000)
	10-12 Ft	SBD-I14-A	SBD-I14-A-2	Carbon Tetrachloride (110)
		SBD-J12-C1	SBD-J12-C1-2	Carbon Tetrachloride (67), Ethylbenzene (19000)
	4-6 Ft	SP-PIRM-57	SB-PIRM-57-2	Ethylbenzene (65000), Xylenes (110000)
	4-6 Ft	SP-PIRM-58	SB-PIRM-58-2	Ethylbenzene (80000), 1,3,5-TMB (5200) Xylenes (150000)
	8-10 Ft	SP-PIRM-58	SB-PIRM-58-3	Ethylbenzene (80000), 1,3,5-TMB (5200) Xylenes (150000)
	4-6 Ft	SP-PIRM-63	SP-PIRM-63-2	Chloroform (420)

In general, the highest concentrations of VOCs are found in UND-5 in the 4- to 6-ft bgs or 5- to 7-ft bgs interval. These samples generally were collected from areas where former wastewater ponding was observed and a majority of the samples were collected from the black carbon or similar waste materials or underlying stained soils (see boring logs in Appendix C). The highest concentrations are associated with BTEX and other fuel-related compounds such as ethylbenzene, MTBE and xylenes. Carbon tetrachloride, 1,3,5-TMB, and chloroform were also detected frequently in UND-5. Chloroform was detected at concentrations in excess of the SSL in the Bone Yard and the Ortho-Xylene area. The highest concentration of PCE was observed in UND-2 and was limited to one location in the 0-0.5 ft bgs interval. Step out sampling in and around UND-2 confirmed that the lateral and vertical extent of PCE is very limited.

2.2.1.2 SVOCs

Approximately 1085 shallow soil samples were collected from approximately 435 locations Site-wide for SVOC analysis during Step 1 through Step 5 activities. Per the SSL screening evaluation process described in the Soil RI Report (Parsons 2004d), the USEPA Region IX direct contact PRGs are the SSLs for SVOCs and the following six SVOCs had concentrations in excess of the SSL (SSLs in parentheses):

- Benzo(b+k)fluoranthene (1,283 ug/kg)
- Benzo(a)anthracene (2,109 ug/kg)
- Benzo(a)pyrene (211 ug/kg)
- Chrysene (12,834 ug/kg)
- Hexachlorobenzene (1,077 ug/kg)
- Pentachlorophenol (8,998 ug/kg)

The following table summarizes the SVOC sample results where individual COPCs were detected at concentrations in excess of the SSL.

Subarea	Depth Interval (ft bgs)	Sample Location	Sample ID	COPC (concentration in ug/kg)
BONE YARD	0-0.5 Ft	SB-B09	SB-B09-1	Benzo(a)anthracene (460) Benzo(a)pyrene(560) Chrysene (570)
ORTHO-XYLENE	0-0.5 Ft	Demo-WWSWTS-2	Demo-WWSWTS-2-1	Benzo(a)anthracene (75000) Chrysene (170000)
REFRIGERANT PLANT	0-0.5 Ft	SB-D09-D4	SB-D09-D4-1	Hexachlorobenzene (1500)
	0-0.5 Ft	Demo-GPA-3-1	Demo-GPA-3-1-1	Hexachlorobenzene (6600)
	0-0.5 Ft	Demo-OS1-1	Demo-OS1-1-1	Hexachlorobenzene (5100)
	0-0.5 Ft	SB-D10	SB-D10-1	Hexachlorobenzene (4400)
	0-0.5 Ft	SB-PIRM-84	SB-PIRM-84-1	Hexachlorobenzene (1500)
SW CORNER LOT	0-0.5 Ft	SB-M03	BD100903-A	Benzo(a)anthracene (700) Benzo(a)pyrene(640) Chrysene (810)
		SB-M03	SB-M03-1	Benzo(a)anthracene (600) Benzo(a)pyrene(560) Chrysene (680)
	0-0.5 Ft	Demo-SRUA-2	Demo-SRUA-2-1	Benzo(b+k)fluoranthene (total) (7800) Benzo(a)anthracene (4100) Benzo(a)pyrene(3900)
UND-3	0-0.5 Ft	SB-I07	SB-I07-1	Benzo(b+k)fluoranthene (total) (470) Benzo(a)anthracene (4300) Benzo(a)pyrene(630) Chrysene (9500)
		SB-I08-C	SB-I08-C-1	Hexachlorobenzene (7900)
	4-6 Ft	SB-I07	SB-I07-2	Benzo(b+k)fluoranthene (total) (2100) Benzo(a)anthracene (22000) Benzo(a)pyrene (3000) Chrysene (44000)
UND-5	0-0.5 Ft	SB-K10	SB-K10-1	Benzo(b+k)fluoranthene (total) (790) Benzo(a)anthracene (320) Benzo(a)pyrene (260) Chrysene (640) Pentachlorophenol (6200)
		SB-K11	SB-K11-1	Benzo(a)anthracene (840) Chrysene (1700) Pentachlorophenol (13000)

Subarea	Depth Interval (ft bgs)	Sample Location	Sample ID	COPC (concentration in ug/kg)
		SB-K14	SB-K14-1	Pentachlorophenol (22000)
		SB-L11	SB-L11-01	Chrysene (62) Hexachlorobenzene (210) Pentachlorophenol (14000)
		SB-L13	SB-L13-01	Pentachlorophenol (15000)
	4-6 Ft	SB-L13	SB-L13-02	Pentachlorophenol (110000)
	8-10 Ft	SB-M15	SB-M15-3	Pentachlorophenol (20000)

Most exceedances of the SSLs for SVOCs were found in UND-5, with the exception of benzo(a)pyrene at SB-B09-1 and SB-M03-1 (Bone Yard and SW Corner Lot, respectively), hexachlorobenzene at SB-D09-D4-1 (Refrigerant Plant) and benzo(b+k)flouranthene, chrysene, benzo(a)pyrene, and benzo(a)anthracene at SB-I07, located in the former Phthalic Anhydride Landfill area in UND-3. Samples with SSL exceedances from UND-5 were collected in the areas with observed black carbon or other waste materials or stained soils found directly underneath the waste materials (Appendix C). Samples from boring SB-I07 with exceedances of the SSL were collected from materials described as phthalic anhydride waste (Appendix C).

The majority of the highest SVOC concentrations are generally found in the near-surface samples (0- to 0.5-ft bgs), and concentrations sharply decline with depth (in samples collected from 8- to 10-ft bgs). Of note, only one exceedance of the SSL was identified in a sample collected from the 8- to 10-ft bgs interval (SB-M15-3).

2.2.1.3 Pesticides/PCBs

Pesticides

Approximately 1021 shallow soil samples were collected from approximately 373 locations Site-wide for pesticides analysis during Step 1 through Step 5 activities. Per the SSL screening evaluation process described in the Soil RI Report (Parsons 2004d), the USEPA Region IX direct contact PRGs are the SSLs for pesticides and the following six pesticides had detected concentrations in excess of the SSL (SSLs in parentheses):

- DDD (10,000 ug/kg)
- DDT (7,000 ug/kg)
- Dieldrin (110 ug/kg)
- Heptachlor (380 ug/kg)
- alpha-BHC (360 ug/kg)
- gamma-BHC (1,700 ug/kg)

DDT was detected at the greatest frequency and concentration in excess of its SSL, compared to the related compounds DDD and DDE. The following table summarizes the pesticide sample results where individual COPCs were detected at concentrations in excess of the SSL.

Subarea	Depth Interval (ft bgs)	Sample Location	Sample ID	COPC (concentration in ug/kg)
NW	0-0.5 FT	SB-B05	SB-B05-1	DDT (22000)
REFRIGERANT PLANT	0-0.5 Ft	SB-E08-D	SB-E08-D-1	Dieldrin(130)
SW CORNER LOT	0-0.5 Ft	SB-M03-C2	SB-M03-C2-1	DDT(23000)
	0-0.5 Ft	SB-N04	SB-N04-1	DDT(7000)
	0-0.5 Ft	Demo-BP-01	Demo-BP-01-1	DDT (14000)
UND-3	4-6 Ft	SB-I07	SB-I07-2	Dieldrin (470), Heptachlor (440)
UND-4	4-6 Ft	SB-M06	SB-M06-2	DDT (19000), alpha-BHC (850)
UND-5	0-0.5 Ft	SB-L09-C	SB-L09-C-1	DDT (53000)
		SB-L09-C	BD102805-A	DDT (21000),
		SB-K10	SB-K10-1	DDD (25000), DDT (90000)
		SB-K11	SB-K11-1	DDD (17000), DDT (120000), alpha-BHC (72000), gamma-BHC (6600)
UND-5	0-0.5 Ft	SB-K13	SB-K13-1	DDT (23000)
		SB-L11	SB-L11-01	DDD (12000), DDT (70000)
		SB-M10	SB-M10-1	DDT (37000)
		GP-4	GP4-SV34-1	DDT (19000)
		TB-1	TB1-UND5-1	DDT (26000)
	4-6 Ft	SB-K12	SB-K12-2	DDD (11000), DDT (24000)
		SB-K13	SB-K13-2	DDT (12000), alpha-BHC (1800)
		SB-K14	SB-K14-2	DDD (13000), DDT (51000),
		SB-L14	SB-L14-2	DDT (12000), alpha-BHC (1100)
	5-7 Ft	SBD-J12-C1	SBD-J12-C1-1	alpha-BHC (710)
		SBD-K13-B	SBD-K13-B-1	DDD (1300), DDT (7400)
	0-0.5 Ft	SB-PIRM-63	SB-PIRM-63-1	DDT(18000), alpha-BHC (1200)
		SB-PIRM-63	SB-PIRM-63-2	DDT(86000), alpha-BHC (570)
		SB-PIRM-73	SB-PIRM-73-1	DDT(18000), alpha-BHC (960)

The highest concentrations and frequencies of pesticides detected are generally found in UND-5 with the exception of limited exceedances found in UND-3, UND-4, the Refrigerant Plant, the SW Corner Lot and the NW area. Again, samples from UND-4 and UND-5 with exceedances of the SSL were collected from areas containing waste materials or underlying stained soils (see Appendix C of the Step 1-4 RI Report). The highest concentrations of pesticides are found in the 0-0.5-ft bgs and 4-6 ft bgs interval. As is expected with pesticides, due to their high adsorptive affinity to soils, which limits their vertical mobility, concentrations generally decrease with depth. It should be noted that no pesticides were found to have concentrations in excess of the SSL in the 8-10 ft bgs interval.

PCBs

Approximately 1050 shallow soil samples were collected from approximately 380 locations Site-wide for PCB analysis during Step 1 through Step 5 activities. Per the SSL screening evaluation

presented in the Soil RI Report (Parsons 2004d), the USEPA Region IX direct contact PRGs are the appropriate SSLs for PCBs. Only three individual isomers, Aroclors 1248, 1254, and 1260, had detected concentrations in excess of the SSL (all isomers have a SSL of 744 ug/kg).

The following table summarizes the PCB sample results where individual COPCs were detected at concentrations in excess of the SSL or the total PCB concentration was in excess of the SSL.

Subarea	Depth Interval (ft bgs)	Sample Location	Sample ID	COPC (concentration in ug/kg)
NW	0-0.5 Ft	SB-A07	SB-A07-1	Aroclor-1248 (2000), Aroclor-1260 (770)
	4-6 Ft	SB-A07	SB-A07-2	Aroclor-1248 (2100)
	8-10 Ft	SB-A07	SB-A07-3	Aroclor-1248 (1400)
	8-10 Ft	SB-D06	SB-D06-3	Aroclor-1248 (970)
REFRIGERANT PLANT	0-0.5 Ft	SB-E08-D	SB-E08-D-1	Aroclor-1254 (18000), Total PCB (18000)
	0-0.5 Ft	Demo-HBTLS-1	Demo-HBTLS-1-1	Arochlor-1016 (34000)
SW CORNER LOT	0-0.5 Ft	SB-N03	SB-N03-1	Aroclor-1260 (3800), Total PCB (3800)
	0-0.5 Ft	SRUA-2	SRUA-2-1	Aroclor-1260 (1100)
	0-0.5 Ft	Demo-WP-NWALL	Demo-WP-NWALL	Aroclor-1248 (1400)
	0-0.5 Ft	Demo-WSTPCB-3	Demo-WSTPCB-3	Aroclor-1248 (1400)
	0-0.5 Ft	SB-O04	SB-O04-1	Aroclor-1260 (8600)
	0-0.5 Ft	SB-PIRM-100	SB-PIRM-100-1	Aroclor-1260 (850)
	4-6 Ft	SB-PIRM-103	SB-PIRM-103-2	Aroclor-1260 (4600)
	4-6 Ft	SB-PIRM-93	SB-PIRM-93-2	Aroclor-1260 (1400)
	0-0.5 Ft	SB-PIRM-94	SB-PIRM-94-1	Aroclor-1260 (3200)
	0-0.5 Ft	SB-PIRM-96	SB-PIRM-96-1	Aroclor-1260 (1300)
UND-1	0-0.5 Ft	SB-C14	SB-C14-1	Aroclor-1248 (660), Aroclor-1260 (190), Total PCB (850)
UND-4	4-6 Ft	SB-M06	SB-M06-2	Aroclor-1260 (1200), Total PCB (1200)
UND-5	0-0.5 Ft	SB-K10	SB-K10-1	Aroclor-1248 (760), Aroclor-1260 (1700), Total PCB (2460)
		SB-K11	SB-K11-1	Aroclor-1248 (2400), Aroclor-1260 (3300), Total PCB (5700)
		SB-K13	SB-K13-1	Aroclor-1248 (2100), Aroclor-1260 (4700), Total PCB (6800)
		SB-L11	SB-L11-01	Aroclor-1260 (9500), Total PCB (9500)
	4-6 Ft	SB-K12	SB-K12-2	Aroclor-1260 (8300), Total PCB (8300)
		SB-K14	SB-K14-2	Aroclor-1248 (2100), Aroclor-1260 (5100) Total PCB (7200)
		SB-L14	SB-L14-2	Aroclor-1248 (810), Aroclor-1260 (680), Total PCB (1490)

The occurrence of PCBs Site-wide is limited. The majority of the samples with elevated concentrations of PCBs in excess of the SSL are found in the 0-0.5 ft bgs and 4-6 ft bgs interval at UND-5. Limited exceedances of the SSL are also found in UND-1, UND-4, the SW Corner